BULLETIN
du MUSÉUM NATIONAL d'HISTOIRE NATURELLE

PUBLICATION BIMESTRIELLE

zoologie

306

N° 436 JANVIER-FÉVRIER 1977

BULLETIN
du
MUSÉUM NATIONAL D'HISTOIRE NATURELLE

57, rue Cuvier, 75005 Paris

Le *Bulletin du Muséum national d'Histoire naturelle*, revue bimestrielle, paraît depuis 1895 et publie des travaux originaux relatifs aux diverses branches de la Science.

Les tomes 1 à 34 (1895-1928), constituant la 1re série, et les tomes 1 à 42 (1929-1970), constituant la 2e série, étaient formés de fascicules regroupant des articles divers.

A partir de 1971, le *Bulletin* 3e série est divisé en six sections (Zoologie — Botanique — Sciences de la Terre — Sciences de l'Homme — Sciences physico-chimiques — Écologie générale) et les articles paraissent, en principe, par fascicules séparés.

S'adresser :

— pour les **échanges**, à la Bibliothèque centrale du Muséum national d'Histoire naturelle, 38, rue Geoffroy-Saint-Hilaire, 75005 Paris (C.C.P., Paris 9062-62) ;

— pour les **abonnements** et les **achats au numéro**, à la Librairie du Muséum, 36, rue Geoffroy-Saint-Hilaire, 75005 Paris (C.C.P., Paris 17591-12 — Crédit Lyonnais, agence Y-425) ;

— pour tout ce qui concerne la **rédaction**, au Secrétariat du *Bulletin*, 57, rue Cuvier, 75005 Paris.

Abonnements pour l'année 1977

Abonnement général : France, 530 F ; Étranger, 580 F.

Zoologie : France, 410 F ; Étranger, 450 F.

Sciences de la Terre : France, 110 F ; Étranger, 120 F.

Botanique : France, 80 F ; Étranger, 90 F.

Écologie générale : France, 70 F ; Étranger, 80 F.

Sciences physico-chimiques : France, 25 F ; Étranger, 30 F.

International Standard Serial Number (ISSN) : 0027-4070.

BULLETIN DU MUSÉUM NATIONAL D'HISTOIRE NATURELLE
3e série, no 436, janvier-février 1977, Zoologie 306

A review of the Labrid Fishes of the genus *Paracheilinus* with description of two new species from the Western Indian Ocean

by John E. RANDALL and Mireille L. HARMELIN-VIVIEN *

Résumé. — Le genre *Paracheilinus* Fourmanoir (Pisces : Labridae) est voisin du genre *Cirrhilabrus*, mais s'en distingue principalement par une formule différente de la nageoire dorsale : IX, 11 au lieu de XI, 9 habituellement chez *Cirrhilabrus*.

Il existe quatre espèces de *Paracheilinus* : *P. octotaenia* Fourmanoir de mer Rouge, caractérisée par une nageoire caudale arrondie, aucun rayon dorsal allongé et 4 à 8 lignes sombres longitudinales continues le long du corps ; *P. mccoskeri* n. sp. des Comores avec la nageoire caudale également arrondie mais le premier rayon de la dorsale allongé et 3 lignes sombres le long du corps, une seule étant continue ; *P. filamentosus* Allen de Mélanésie et d'Indonésie, caractérisée par 2 à 6 rayons dorsaux filamenteux et une nageoire caudale en croissant ; *P. hemitaeniatus* n. sp. de Madagascar présentant la même forme de caudale que *P. filamentosus* mais n'ayant aucun rayon dorsal allongé ; cette espèce présente 6 lignes sombres suivant les rangées d'écailles sur le tiers antérieur ou jusqu'à la moitié du corps.

Les espèces de *Paracheilinus* sont de petite taille (72 mm LS au maximum) ; elles forment de petits groupes à un mètre ou plus au-dessus du fond et se nourrissent de plancton.

Abstract. — The labrid fish genus *Paracheilinus* Fourmanoir is closely related to *Cirrhilabrus*, differing principally in having IX,11 dorsal rays instead of the usual count of XI,9 for *Cirrhilabrus*. There are four species of *Paracheilinus* : *octotaenia* Fourmanoir from the Red Sea, characterized by a rounded caudal fin, no prolonged dorsal rays, and four to eight continuous longitudinal dark lines on the body ; *mccoskeri* n. sp. from the Comoro Islands, also with a rounded caudal fin but possessing a prolonged first dorsal ray and three dark lines on the body, only one of which is continuous ; *filamentosus* Allen from Melanesia and Indonesia, distinctive in having two to six filamentous dorsal rays and an emarginate to lunate caudal fin ; and *hemitaeniatus* n. sp. from Madagascar with a caudal fin shape like *filamentosus* but lacking the prolonged dorsal rays ; it has six dark lines following the scale rows on the anterior third to half of the body.

The species of *Paracheilinus* are small (maximum 72 mm SL) ; they form aggregations a meter or more off the bottom and feed on zooplankton.

The labrid fish *Paracheilinus octotaenia* was described from the Red Sea by FOURMANOIR in ROUX-ESTÈVE and FOURMANOIR (1955) from a single specimen 64 mm SL (standard length) (MNHN 52-296). No generic description or diagnosis was given for *Paracheilinus*, and the description of *octotaenia* was not detailed.

ALLEN (1974) described a second species in the genus, *P. filamentosus*, from the Solomon Islands, New Guinea and the Molucca Islands. He presented additional data on

* *Bishop Museum, Honolulu, and Station Marine d'Endoume et Centre d'Océanographie, Marseille.*

P. octotaenia. He also provided a diagnosis of *Paracheilinus* and made a comparison with the other genera of the Cheilininae : *Cheilinus*, *Cirrhilabrus*, *Pseudocheilinus*, and *Pseudocheilinops*. He pointed out that *Paracheilinus* is most closely related to *Cirrhilabrus*, not *Cheilinus*. *Cirrhilabrus* differs mainly in having dorsal rays XI or XII, 8-10 (usually XI, 9), in contrast to IX, 11 for *Paracheilinus*.

Springer and Randall (1974) have noted a curious double structure of the pupil of the eye of *Cirrhilabrus* which is also found in *Paracheilinus*, *Pseudocheilinus*, *Pseudocheilinops*, and *Pteragogus*, but not *Cheilinus*. Further study is needed to evaluate the significance of this structure to the division of the Labridae into subfamilies.

Three specimens of a third new species of *Paracheilinus* were collected by the junior author in Madagascar in 1972, and 27 specimens of a fourth by John E. McCosker of the Steinhart Aquarium in the Comoro Islands in 1975. We are indebted to Dr McCosker and Dr William F. Smith-Vaniz of the Academy of Natural Sciences of Philadelphia for passing the Comoro material on to us. They had realized this species was new and had planned to describe it.

Type specimens have been deposited in the Academy of Natural Sciences of Philadelphia (ANSP), Australian Muscum in Sydney (AM), Bernice P. Bishop Museum in Honolulu (BPBM), British Museum (Natural History) in London [BM(NH)], California Academy of Sciences in San Francisco (CAS), Muséum national d'Histoire naturelle in Paris (MNHN), J. L. B. Smith Institute of Ichthyology of Rhodes University at Grahamstown (RUSI), Senckenberg Museum in Frankfurt (SMF), and the U. S. National Museum of Natural History in Washington, D. C. (USNM).

Counts and measurements were made in the manner described by Randall (1972). In the descriptions of the new species data in parentheses apply to the paratypes if different from the holotype.

Paracheilinus

Paracheilinus Fourmanoir, in Roux-Estève and Fourmanoir, 1955. *Annls Inst. océanogr.*, **30** : 199 (type species, *Paracheilinus octotaenia* Fourmanoir, by original designation).

Diagnosis

Dorsal rays IX (rarely VIII), 11 ; anal rays III, 9 (rarely 8) ; pectoral rays 14 (uppermost rudimentary) ; pelvic rays I, 5 ; principal caudal rays 13 (median 11 branched) ; lateral line interrupted, the pored scales 15 to 17 + 5 to 9 ; head scaled except interorbital space and snout ; medial predorsal scales 5 ; gill rakers 13 to 18 ; branchio-stegal rays 5 ; vertebrae 25 ; depth of body 2.9 to 3.4 in standard length ; scleral cornea of pupil ofeye divided nearly vertically into two roundish juxtaposed portions ; snout short, 3.3 to 4.8 in head length ; mouth small, oblique, the maxillary not reaching a vertical at anterior edge of eye, the premaxillary slightly protractile ; three pairs of canine teeth anteriorly in upper jaw, the third (most lateral) pair the largest and sharply curved outward and posteriorly ; a single pair of canines anteriorly in lower jaw ; no canine at corner of mouth ; no teeth on roof of mouth ; margin of preopercle smooth or with fine serrations on upper

limb ; dorsal and anal spines slender, progressively longer posteriorly ; caudal fin varying from rounded to strongly lunate ; pelvic fins inserted below lower pectoral base, short, not reaching or just reaching anus.

Key to the species of *Paracheilinus*

1 a. Caudal fin rounded 2

1 b. Caudal fin emarginate to lunate 3

2 a. No dorsal rays prolonged ; gill rakers 16 to 18 ; canine teeth at front of lower jaw not strongly curved laterally ; body with eight continuous narrow dark stripes, not including one at dorsal base (only about upper four visible on small individuals in preservative) (Red Sea)...... *octotaenia*

2 b. First dorsal ray prolonged (at a standard length of about 38 mm or more) ; gill rakers 13 to 15 ; canine teeth at front of lower jaw enlarged and strongly curved laterally ; body with three narrow dark stripes, not including one at dorsal base, the first interrupted, the second (in pectoral region) very short, and the third from pectoral axil running full length of body (Comoro Islands).. *mccoskeri* n. sp.

3 a. Two to six dorsal soft rays greatly prolonged ; dorsal and anal fins not dusky (except basally in dorsal fin of large males) ; no dark band nearly surrounding pectoral fin base ; three narrow dark stripes on body (in preservative), the uppermost usually extending to caudal base (six stripes may be visible in life, three of which extend to caudal base) (Melanesia and Indonesia).. *filamentosus*

3 b. No prolonged dorsal soft rays ; dorsal and anal fins dusky to blackish posteriorly ; dark band nearly surrounding pectoral fin base ; six dark stripes on body (in preservative), the heavily pigmented portion of each confined to anterior half of body (Madagascar)........... *hemitaeniatus* n. sp.

Paracheilinus octotaenia

(Fig. 1)

Paracheilinus octotaenia Fourmanoir in Roux-Estève and Fourmanoir, 1955. *Annls Inst. océanogr.*, **30** : 199, fig. 1 (type-locality île Abulat, Red Sea).

Diagnosis

Caudal fin rounded ; no dorsal rays prolonged ; gill rakers 16 to 18 ; depth of body 2.8 to 3.2 in SL ; snout 3.4 to 4 in head.

Color in alcohol of adult males ligth brown with eight dark longitudinal lines on body following centers of scale rows (except the lowermost of the eight which curves across middle of thorax) ; head with dark lines as follows : two across interorbital ; one mid-dorsally on nape ; two posteriorly from eye ; one passing from snout, below eye, and across lower operculum ; and one passing diagonally downward and posteriorly from corner of mouth ; a narrow dark band at base of spinous portion of dorsal fin which disappears in anterior soft portion of fin ; a black submarginal line posteriorly on median fins. Color of a fresh specimen from an Ektachrome transparency taken by the senior author (reproduced in black and white herein as fig. 1) : salmon pink shading to yellow on ventral part of head,

thorax, and abdomen, the dark lines on head and body bluish ; dorsal fin yellow on spinous portion shading to red on soft, with a pale blue margin and blackish submarginal line (better developed posteriorly) ; four faint, dark-edged light blue dots in the middle of spinous portion of dorsal fin and four posteriorly on soft portion (one near base on each of last four membranes) ; caudal and anal fins red with light blue margins and dark submarginal lines ; paired fins light yellowish with a tinge of pink.

Females are lighter brown, with only four or five longitudinal dark lines apparent in preservative ; bands on head poorly developed ; no black submarginal line in median fins. A juvenile specimen 23 mm in SL is colored much like the females but has a prominent dark spot as large as pupil posteriorly on caudal peduncle just above lateral line. This spot is typical of small individuals of the genus *Cirrhilabrus*.

Remarks

Fourmanoir described and illustrated the dorsal fin membranes of *octotaenia* as incised with a long filament extending from behind the tip of each spine. Allen (1974), who examined the holotype, pointed out that eight specimens sent on loan to him from the Bishop Museum all have the dorsal fin membranes without indentation between spines and without projecting filaments. He concluded that the alleged filaments of the dorsal fin of Fourmanoir's drawing probably represent torn fin membranes.

The type-locality, the island of Abulat, is located off the coast of Saudi Arabia at approximately 20° N, 40° E.

The Bishop Museum has four lots of this species from the Gulf of Aqaba, Red Sea (largest 71 mm SL). Three were collected by the senior author in the depth range of 15 to 43 m ; the other was taken by Victor G. Springer and presented as a gift to the Bishop Museum. The U. S. National Museum of Natural History has 84 other specimens collected by Springer. The usual habitat is clear water of outer reef areas. This fish is often seen in large feeding aggregations a meter or more above the bottom ; it feeds on zooplankton. Only the large individuals appear to be males.

Paracheilinus mccoskeri n. sp.
(Fig. 2)

Holotype : CAS 35176, male, 55.7 mm SL, Comoro Islands, Grande Comore Island, N of Moroni, reef and *Padina* bed in front of Said Ibrahim's Palace, 150 m offshore, sloping bottom in 20-35 m, Pronoxfish (contains rotenone), J. E. McCosker, 26 February 1975.

Paratypes : ANSP 133779, 6 : 28.8-55.7 mm SL ; AM I. 18604-001, 40.8 mm SL ; BPBM 19728, 7 : 26.6-55.0 mm SL ; BM(NH) 1976. 2.13.1-2, 2 : 32.9-35.1 mm SL ; CAS 34472, 8 : 24.0-56.9 mm SL ; MNHN 1976-5, 2 : 37.0-40.4 mm SL ; RUSI 841, 35.9 mm SL ; SMF 13393, 40.8 mm SL ; USNM 215274, 2 : 32.5-41.2 mm SL — all with same data as holotype ; CAS 32569, 32.5 mm SL, Grande Comore Island, about 5 km N of Itsandra, garden eel bed, sloping bottom of coarse coral sand, 25-30 m, Pronoxfish, J. E. McCosker, 7 March 1975.



Fig. 1. — *Paracheilinus octotaenia* Fourmanoir, male, 69 mm SL, Gulf of Aqaba, Red Sea, BPBM 13856. (*Photo by John E. Randall.*)

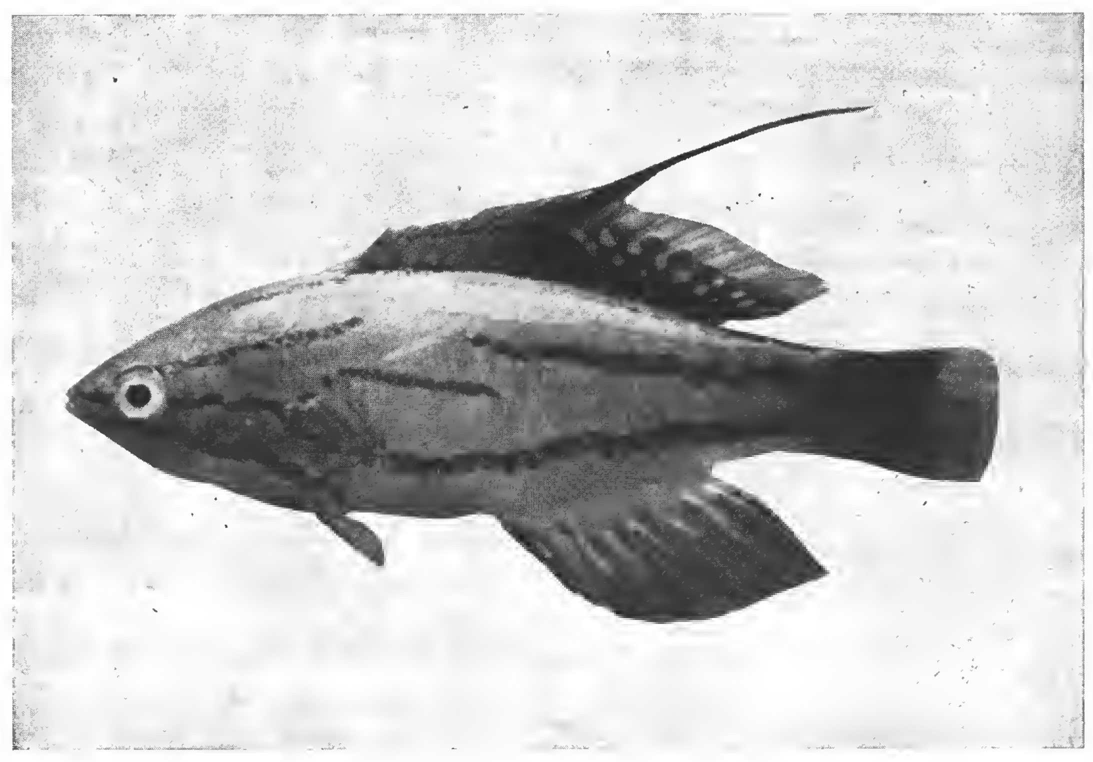


Fig. 2. — Holotype of *Paracheilinus mccoskeri* Randall and Harmelin-Vivien, male, 55.7 mm SL, Comoro Islands, CAS 35176. (*Photo by John E. McCosker.*)

Diagnosis

Caudal fin slightly rounded : first dorsal soft ray prolonged (at a standard length greater than about 38 mm) ; gill rakers 13 to 15 ; depth of body 3 to 3.35 in SL ; snout 3.6 to 4.1 in head. Color in alcohol pale with three dark brown lines on head and body, the males with blackish posteriorly on caudal peduncle and fin.

Description

Dorsal rays IX, 11 ; anal rays III, 9 ; pectoral rays 14 (uppermost rudimentary, the second unbranched) ; pelvic rays I, 5 ; principal caudal rays 13 (upper and lower unbranched) ; lateral-line scales 17 + 7 (15 to 17 + 5 to 9) (in addition, 1 scale posterior to end of hypural) ; scales above lateral line to origin of dorsal fin 2 ; scales below lateral line to origin of anal fin 6 ; predorsal scales 5 ; circumpeduncular scales 16 ; gill rakers 14 (13 to to 15) ; vertebrae 25.

Depth of body 3.05 (3.09-3.35) in SL ; width of body 2.22 (1.96-2.20) in depth ; head 3.08 (2.93-3.07) in SL ; snout 3.61 (3.76-4.1) in head ; orbit 4.12 (3.37-4.13) in head ; interorbital space convex, the bony width 4.17 (4.1-4.38) in head ; least depth of caudal peduncle 2.32 (2.12-2.32) in head.

Mouth small, terminal ; maxillary nearly reaching a vertical at anterior edge of orbit, only the lower edge of premaxillary exposed when mouth fully closed. Three pairs of canine teeth at front of upper jaw, the median two pairs projecting strongly forward and curving laterally and slightly downward, the large lateral third pair (more than twice as large as median teeth) projecting outward and downward and curving posteriorly ; a row of small teeth medial to anterior canines, and a row of slightly larger teeth along side of jaw (25 on each side of holotype, becoming a double row posteriorly on side of lower edge of premaxillary ; one pair of very large protruding canine teeth anteriorly in lower jaw which curve strongly laterally and slightly upward (in the holotype these teeth strike the lateral third pair of upper teeth near the base when mouth is closed) ; a few small teeth medial to large lower canines, and a row of 20 teeth along each side of jaw about the same size as the comparable upper teeth. Lower lip with a thin flap projecting downward on side of lower jaw, its greatest depth contained about 4 times in orbit. Gill rakers not long, the longest about 3 in longest gill filament, about 5 in orbit. Nostrils small and inconspicuous, the posterior before upper edge of eye, the anterior in a short membranous tube diagonally downward in front of posterior nostril, the distance between the two openings contained about 3 times in orbit.

Head covered with relatively large scales except snout, chin, and interorbital space ; two rows of scales on cheek between eye and margin of preopercle ; a row of large elongate pointed scales along base of dorsal fin above the single row of large scales superior to lateral line ; a comparable row of scales along base of anal fin ; basal half of caudal fin covered with large scales ; paired fins not scaled except for two mid-ventral scales posterior to origin of pelvic fins.

Lower limb and corner of preopercle thin and membranous ; ventral part of upper limb a finely serrate bony edge, the dorsal part covered by a large scale.

Orbit encircled by 11 prominent pores of cephalic lateral-line system ; two mid-dorsal pores in upper interorbital space ; two pores on upper snout on each side (one forming the apex of a triangle with the nostrils) ; three pores in a curved line on each side at front of nape linked to posterior mid-dorsal pore ; a pore at upper end of preopercular margin ; remaining pores of preopercular series partially obscured by scales ; a series of four mandibular pores running anterior to lower preopercular series.

Caudal fin slightly rounded, the longest rays 1.33 (1.29-1.4) in head. Origin of dorsal fin above second lateral-line scale, slightly anterior to upper pectoral base ; first dorsal spine 7.4 (6.56-7.86) in head ; remaining dorsal spines progressively longer, the ninth 2.12 (2.12-2.34) in head ; first dorsal ray prolonged on adults beginning at a standard length of about 38 mm (greatly extended on males, this ray in holotype 1.87 in SL) (second dorsal ray longer than first in juveniles). Origin of anal fin below base of first dorsal soft ray ; first anal spine moderately long, 3.0 (3.75-4.48) in head ; third anal spine 2.48 (2.45-3.18) in head ; sixth to eighth anal soft rays the longest, 1.26 (1.22-2.06) in head. Pectoral fins reach posterior to a vertical at pelvic tips, nearly to anus, 1.49 (1.47-1.64) in head ; pelvic fins relatively short, 2.2 (2.18-2.41) in head.

Table I. — Proportional measurements of type specimens of *Paracheilinus mccoskeri* expressed as a percentage of the standard length.

	Holotype CAS 35176	Paratypes BPBM 19728			
Standard Length (mm)	55.7	29.1	37.3	51.9	55.0
Depth of body	32.7	29.9	29.8	29.9	32.4
Width of body	14.7	15.1	15.0	15.2	14.7
Head length	32.5	34.0	34.1	33.8	32.6
Snout length	9.0	8.9	8.3	9.0	8.8
Orbit diameter	7,9	10.1	9.0	8.1	7.9
Bony interorbital width	7.8	8.2	8.3	7.7	7.8
Length of upper jaw	7.7	8.2	7.8	7.6	7.8
Least depth of caudal peduncle	14.0	15.8	16.1	14.5	14.1
Length of caudal peduncle	19.2	17.5	17.7	18.9	18.3
Snout to origin of dorsal fin	33.2	37.1	34.6	34.2	32.7
Snout to origin of anal fin	57.2	60.0	60.8	59.7	58.0
Length of caudal fin	24.3	26.4	26.5	24.9	23.7
Length of pectoral fin	21.8	20.7	21.2	21.4	22.2
Length of pelvic fin	14.7	—	14.1	14.4	14.9
Length of first dorsal spine	4.4	4.8	5.2	4.3	4.3
Length of last dorsal spine	15.4	14.5	15.0	15.4	15.4
Length of first dorsal ray	53.3	16.1	18.3	44.0	—
Length of dorsal fin base	55.7	51.2	51.3	50.9	56.2
Length of first anal spine	10.8	7.6	8.0	9.0	—
Length of third anal spine	13.1	11.5	10.7	12.1	13.3
Length of longest anal ray	25.7	16.5	17.4	23.5	26.7
Length of anal fin base	26.9	27.5	26.8	23.3	24.7

Color of holotype in alcohol pale with narrow dark brown bands as follows : one from nape to one side of mid-dorsal line, along base of dorsal fin, and mid-dorsally to end of caudal peduncle ; one from upper edge of eye to fifth lateral-line scale ; one from beneath tip of pectoral fin along row of scales below lateral line to caudal peduncle ; one from front of snout behind upper lip passing through middle of eye (but not visible on eye) to upper pectoral base where it bifurcates, the upper part passing irregularly and narrowly around upper pectoral base and continuing nearly horizontally to mid-lateral position on body above front of soft portion of anal fin, and the other around lower pectoral base where it is joined by a band from axilla and continues as the broadest band to caudal fin ; and last from edge of upper lip near corner of mouth, touching lower edge of eye, continuing across cheek, and ending on thorax above pelvic fin base ; posterior caudal peduncle and basal half of caudal fin blackish ; outer half of fin dusky except posterior margin which is clear ; dorsal fin dusky, becoming clear distally, with a narrow dark-edged pale band above middle of spinous portion of fin and two irregular rows of dark-edged clear spots in about middle of soft portion (spots higher anteriorly and lower in fin posteriorly) ; remaining fins pale.

Color when fresh from a 35 mm Ektachrome transparency (reproduced here in black and white as fig. 2) : pinkish yellow with a suffusion of light red on head, particularly on snout and operculum ; bands on head and body dusky blue (probably bright blue in life) ; spinous portion of dorsal fin dusky orange-yellow with a narrow dark purplish longitudinal streak in outer two-thirds of fin ; soft portion blackish on basal two-thirds with two adjacent series of large dark-edged pink spots in upper part of zone and pink on outer third with an indistinct whitish area on each membrane ; last few dorsal rays red, particularly basally ; anal fin bright red except for a band of orange-yellow at base ; basal half of caudal fin and adjacent caudal peduncle blackish, with a slightly concave reddish bar at posterior end of this zone, the outer half of fin dusky yellowish gray with a broad red posterior border ; pectoral fins light red with a deep red band at base ; pelvic fins yellow on medial half and light red laterally.

The female and juvenile specimens lack the broad blackish area of the posterior caudal peduncle and basal caudal fin, and the dark longitudinal bands on the head and body are narrower and fainter.

Remarks

Named in honor of John E. McCosker who collected all of the specimens and provided color photographs. He noted that the species was difficult to approach with spear or camera. He recalled seeing only the large males. They swam " jerkily about 1 to 3 feet above the bottom, occasionally turning broadside and momentarily elevating the median fins in an absolutely spectacular display ". Because of this, Dr McCosker bestowed the common name " flasher wrasse " on this fish.

A poison station was carried out just for this species where it was abundant on a sloping bottom of algae, consisting primarily of *Padina*, in the depth range of 25 to 30 m.

Paracheilinus filamentosus
(Fig. 3)

Paracheilinus filamentosus Allen, 1974. *Pacif. Sci.*, **28** (4) : 449, 452, fig. 2 (type-locality, reef off Kranket Island, Madang, New Guinea).

Diagnosis

Caudal fin emarginate to deeply lunate (due to prolongation of caudal lobes) ; two to six dorsal soft rays greatly prolonged ; gill rakers 13 to 16 ; depth of body 3.1 to 3.65 in SL ; snout 3.1 to 3.7 in head (snout relatively longer in adults).

Color in alcohol light brown (some large male individuals with a purplish cast) with three dark longitudinal lines on body following first three scale rows below lateral line, the uppermost the longest, extending onto caudal peduncle (this stripe broken above pectoral fin, the short anterior segment displaced upward) ; a dark line from axil of pectoral fin to beneath opercular flap ; three dark lines radiating posteriorly from eye and two anteriorly ; rays of median fins of large adult males deep blue to purple ; pelvic rays light blue ; median fin rays of females light bluish to purplish ; males with a short dark line on nape leading to base of second dorsal spine and continuing along base of remainder of fin (broader and more heavily pigmented posteriorly, with pale spots in outer part of this zone) ; males may have one or two faint wavy dark lines more distally in dorsal fin ; females may show the dark basal band in the dorsal fin and short dark segment on nape, but very faintly.

Color of an adult male from an Ektachrome transparency taken by the senior author (reproduced in black and white herein as fig. 3) : salmon dorsally, pink ventrally, the broad zone on side with six pink-edged red stripes alternating with yellow ; dorsalmost stripe running from just below upper end of gill opening diagonally to fifth lateral-line scale, reappearing on row of scales below lateral line under scale 9 and continuing nearly to caudal base (this stripe with a median irregular dark bluish line which disappears in about middle of body) ; second stripe from beneath opercular flap to about middle of body ; third from upper base of pectoral fin to caudal base ; fourth from pectoral axil to lower caudal peduncle ; fifth from pectoral base across abdomen and extending faintly to rear base of anal fin ; sixth across middle of thorax and ending anteriorly on abdomen : head with three red stripes with light blue centers except posterior part of lower stripe, the first from snout circling upper eye to origin of lateral line, the second from rear of eye to posterior edge of opercle at level of pectoral base, and the third from posterior upper lip, rimming lower edge of eye, and ending at edge of subopercle ; in addition a short segment posteriorly on upper opercle which is continuous with dorsalmost body stripe ; dorsal fin orange-yellow with a pale blue margin and black submarginal line except where interrupted by filamentous rays ; a red band at base of fin (becoming dark bluish anteriorly) which extends anteriorly onto two scales of nape ; an irregular pale blue band edged in blackish above basal red band in soft portion of fin ; rays of soft portion of fin brownish

red ; membranes of last two rays primarily red ; anal fin red with a pale blue margin ; caudal fin red with a clear crescent in median posterior part of fin with a zone of pale blue on membranes separating red from hyaline and narrow upper and lower margins of pale blue on membranes separating red from hyaline and narrow upper and lower margins of pale blue ; paired fins pale pink, the pelvics with light blue over spine and first membrane.

Remarks

The holotype, a male 62.6 mm SL, is deposited in the Australian Museum (AM I. 16994-001). The largest specimen is a male 65 mm SL (BPBM 14658) which was collected with the holotype. As is true of most labrid populations, females are more numerous and smaller than males. Of 16 specimens collected at Guadalcanal in 10 to 30 m by the senior author (BPBM 16007), five are males from 51 to 55 mm SL and the rest mature females from 30 to 48 mm SL.

Allen (1974) recorded the species from a depth range of 5 to 35 m. He commented that it appears to spend much of its time feeding on zooplankton a meter or more above the substratum. He described the courtship and spawning.

Paracheilinus hemitaeniatus n. sp.
(Fig. 4)

Holotype : BPBM 19599, male, 67.6 mm SL, Madagascar, Tuléar, outer reef slope of barrier reef, 42 m, dynamite, M. L. Vivien, 17 October 1972.

Paratypes : MNHN 1975 — 1144, female, 56.3 mm SL, Madagascar, Tuléar, outer reef slope of barrier reef, coral flagstone, 45 m, dynamite, M. L. Vivien, 13 October 1972 ; BPBM 19600, 29.2 mm SL, same data as preceding.

Diagnosis

Caudal fin varying from slightly emarginate in juveniles to deeply lunate in males (as a result of great prolongation of caudal lobes) no dorsal rays prolonged ; gill rakers 14 to 16 ; depth of body 3.3 to 4.1 in SL ; snout 3.7 to 3.85 in head.

Color in alcohol light brown with six longitudinal dark brown lines on anterior third of body ; a dark brown band nearly surrounding pectoral base : three dark brown lines radiating posteriorly from eye and two anteriorly ; dorsal and anal fins dusky, becoming blackish posteriorly on fins of male.

Description

Dorsal rays IX, 11 ; anal rays III, 9 (III, 8) ; pectoral rays 14 (uppermost rudimentary, the second unbranched) ; pelvic rays I, 5 ; principal caudal rays 13 (upper and lower unbranched) ; lateral-line scales 16 + 6 (16 + 5, some missing on smallest paratype) (in addition, 1 scale posterior to end of hypural) ; scales above lateral line to origin of dorsal

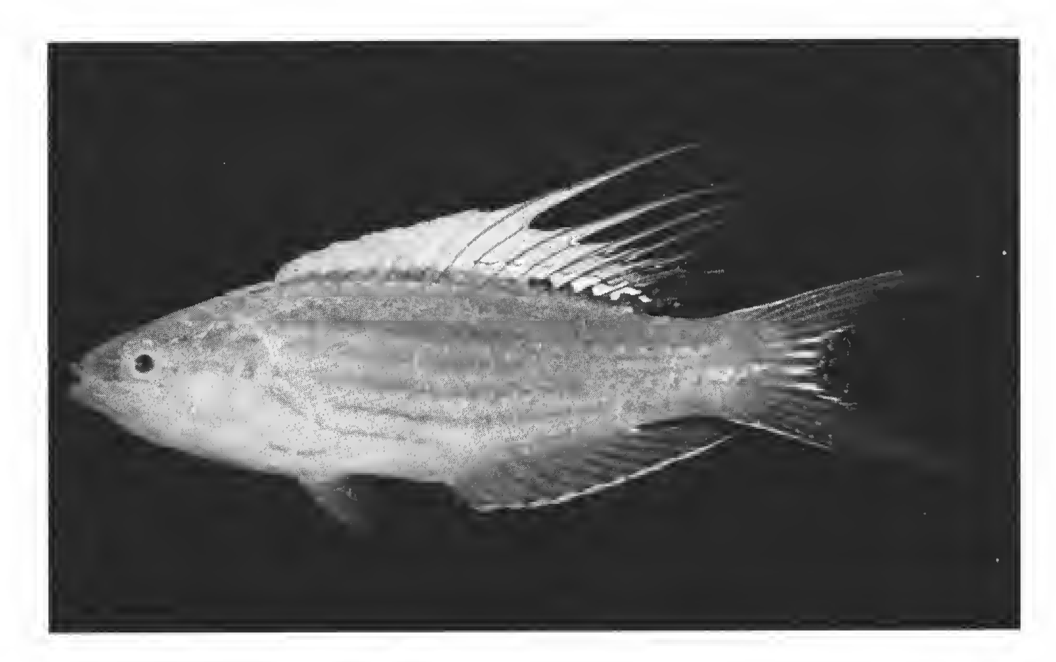


Fig. 3. — *Paracheilinus filamentosus* Allen, male, 53 mm SL, Guadalcanal, Solomon Islands, BPBM 16007. (*Photo by John E. Randall.*)

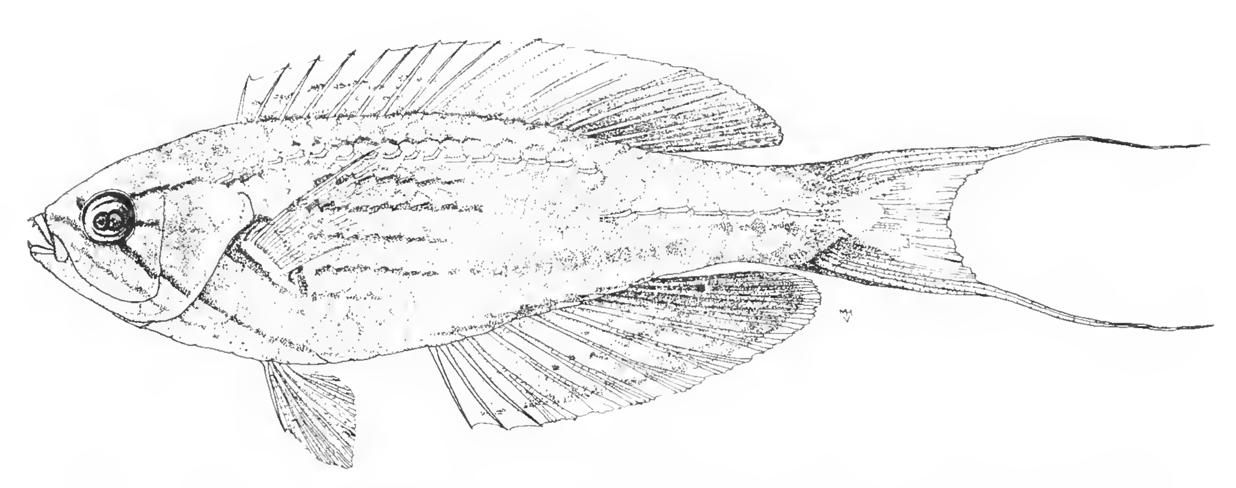


Fig. 4. — Holotype of *Paracheilinus hemitaeniatus* Randall and Harmelin-Vivien, male, 67. 6 mm SL, Madagascar, BPBM 19599. (*Drawing by Mireille L. Harmelin-Vivien.*)

fin 2 ; scales below lateral line to origin of anal fin 6 ; predorsal scales 5 ; circumpeduncular scales 16 ; gill rakers 14 (15 or 16) ; branchiostegal rays 5 ; vertebrae 25.

Body moderately elongate, the depth 3.43 (3.35-4.06) in SL, and compressed, the width 2.08 (1.71-1.9) in depth ; head 3.29 (2.92-3.18) in SL ; snout 3.76 (3.72-3.84) in head ; orbit 4.29 (3.14-3.92) in head ; interorbital space convex, the bony width 3.94 (3.72-3.78) in head ; least depth of caudal peduncle 2.31 (2.18-2.36) in head.

Mouth small, the lower jaw slightly projecting ; maxillary not reaching a vertical at anterior edge of orbit, the posterior part partially exposed when mouth fully closed. Three pairs of canine teeth at front of upper jaw, the median two pairs jutting anteriorly almost horizontally, the lateral third pair (twice as large as median teeth) projecting outward and downward and curving slightly posteriorly ; a row of small teeth median to anterior canines and a row of slightly larger teeth along side of jaw (21 counted on one side of holotype posterior to canines) ; one pair of jutting canine teeth anteriorly in lower jaw about equal in size to median upper canines, fitting between the first and second upper pairs when mouth is closed ; small teeth in a row along side of lower jaw (20 counted on one side of holotype posterior to canine). Lower lip with a broad thin flap projecting downward on side of lower jaw, its greatest depth contained about 3.2 times in diameter of orbit of holotype. Gill rakers not long, the longest about 3 in longest gill filament and 5 in orbit. Nostrils small and inconspicuous, slightly above level of upper edge of eyes, the anterior in a short membranous tube ; distance between anterior and posterior nostrils contained about 3 times in orbit.

Head covered with relatively large scales except snout, chin, and interorbital space ; two rows of scales on cheek between eye and margin of preopercle ; a row of large elongate pointed scales along base of dorsal fin above the single row of large scales superior to lateral line ; a comparable row of scales along base of anal fin ; basal two-thirds of caudal fin (discounting elongate lobes of fin) scaled, the scales posterior to lateral line enlarged ; paired fins not scaled except for two mid-ventral scales posterior to origin of pelvic fins.

Preopercular margin thin and membranous on lower limb and rounded corner (slightly projecting at upper corner), the ventral part of upper limb with a very finely serrate bony edge, the dorsal part covered by a large scale.

Orbit encircled by 11 prominent pores of cephalic lateral-line system ; two pores on upper snout on each side ; two mid-dorsal pores in upper interorbital spaces ; three in a curved line on each side at front of nape linked to posterior mid-dorsal pore ; a pore at upper end of preopercular margin with another a short distance posteriorly ; remaining pores of preopercular series partly obscured by scales ; a series of four mandibular pores running anterior to lower preopercular series.

Caudal fin varying from slightly emarginate in the juvenile paratype to emarginate in the female, to deeply lunate in the holotype by virtue of extreme prolongation of the uppermost and lowermost branched caudal rays (lower caudal filament about 2 mm longer than upper). Origin of dorsal fin above second lateral-line scale, slightly anterior to upper base of pectoral fin ; first dorsal spine 4.0 (4.32-5.07) in head ; remaining dorsal spines progressively longer, the last 1.71 (2.12-2.39) in head ; eighth dorsal soft ray the longest, 1.26 (2.1-2.38) in head (spines and rays of median fins relatively longer in larger individuals). Origin of anal fin beneath base of first dorsal soft ray ; first anal spine long, 2.13 (2.8-3.45) in head ; next two spines progressively longer, the third 1.8 (2.27-2.55) in head ; seventh

anal soft ray the longest, varying from slightly greater than head length in holotype to 2 in head of juvenile paratype. Paired fins not long, the pectorals reaching slightly posterior to a vertical at pelvic tips, the pelvics not reaching anus (but nearly reaching anus in holotype) ; pectoral fins 1.48 (1.45-1.64) in head ; pelvic fins 1.76 (1.88-1.93) in head.

TABLE II. — Proportional measurements of type specimens of *Paracheilinus hemitaeniatus* expressed as a percentage of the standard length.

	HOLOTYPE	PARATYPES	
	BPBM 19599	BPBM 19600	MNHN 1975-1144
Standard Length (mm)	67.6	29.2	56.3
Depth of body	29.2	24.6	29.8
Width of body	14.0	14.4	15.8
Head length	30.4	34.2	31.4
Snout length	8.1	9.2	8.2
Orbit diameter	7.1	10.9	8.0
Bony interorbital width	7.7	9.2	8.3
Length of upper jaw	7.5	8.6	7.7
Least depth of caudal peduncle	13.2	15.7	13.3
Length of caudal peduncle	21.0	18.1	19.6
Snout to origin of dorsal fin	29.4	37.6	31.5
Snout to origin of anal fin	54.7	60.7	57.3
Length of caudal fin	49.5	27.8	28.2
Caudal concavity	32.5	1.7	6.2
Length of pectoral fin	20.5	20.8	21.6
Length of pelvic fin	17.3	17.7	16.7
Length of first dorsal spine	7.6	7.9	6.2
Length of last dorsal spine	17.8	14.3	14.9
Length of longest dorsal ray	24.0	16.4	17.4
Length of dorsal fin base	52.8	51.2	53.6
Length of first anal spine	14.3	10.2	11.2
Length of third anal spine	16.9	13.4	13.8
Length of longest anal ray	31.8	16.8	19.2
Length of anal fin base	26.4	26.7	22.7

Color of holotype in alcohol light brown with six dark brown longitudinal lines following scale rows on anterior third to half of body, the uppermost (above lateral line) beginning below third dorsal spine and continuing faintly to about middle of body, the second beginning just below origin of lateral line and ending on third lateral-line scale (on right side, shorter and less diagonal on the other), reappearing again in scale row below fifth or sixth lateral-line scale and continuing on six more scales ; third, fourth, and fifth dark lines on scale rows below, each progressively shorter (except the fifth which extends very faintly to caudal peduncle), all partly covered by pectoral fin ; sixth row very faint, linked anteriorly to a dark line in axil of pectoral which curves over top of pectoral base and links to a broad dark brown V-shaped mark in front of fin ; two short dark brown

ines extending anteriorly from eye and three posteriorly, the uppermost nearly joining body stripe beginning at origin of lateral line ; middle posterior dark line on postorbital head short, ending near preopercular margin ; third dark line running diagonally from lower edge of eye and continuing across thorax ; a faint broken mid-dorsal dark line on nape ; dorsal fin dusky, becoming blackish posterior to third soft ray ; a blackish band along base of fin ; membranes of first six dorsal spines finely blotched with brown, a series of spots above middle of fin tending to form a horizontal band ; anal fin dusky, becoming blackish posteriorly, approximately the lower half of fin nearly clear ; caudal fin pale, the upper and lower lobes broadly dusky ; pectoral fins pale ; pelvic fins a little dusky.

Color of holotype in life (from color sketch of junior author) : yellow-orange over upper head and back, pale salmon pink ventrally ; side of body light yellow : lines of head and body purple ; dorsal fin red, purple along base and posteriorly, with a broad bright yellow margin and a narrow median partially broken purple stripe on spinous portion of fin ; anal fin similar to dorsal but yellow margin along all of fin and with a purple sub-marginal band ; broken median purple stripe on anal fin begins on the third membrane of the soft part of the fin and extends to the broad posterior purple region ; there is no purple zone basally, but there is a purple band along the ventral part of the body adjacent to the fin ; caudal fin yellow with two large purple areas, one above the other at base of fin ; pectoral fins clear ; pelvic fins light yellow with an area of orange centro-basally.

The female and juvenile paratypes have the same dark markings as the male but considerably fainter ; the dorsal and anal fins are slightly dusky, but there is no concentration of dark pigment posteriorly in these fins.

Remarks

Named *hemitaeniatus* in reference to the restriction of the heavily pigmented part of the dark longitudinal bands to the anterior half of the body.

Known only from three specimens taken in 42 to 45 m off Madagascar.

LITERATURE CITED

Allen, Gerald R., 1974. — A review of the labrid genus *Paracheilinus* with the description of a new species from Melanesia. *Pacif. Sci.*, **28** (4) : 449-455, 2 figs.

Randall, John E., 1972. — A revision of the labrid fish genus *Anampses*. *Micronesica*, **8** (1 & 2) : 151-195, 3 pls., 10 text-figs.

Roux-Estève, R., and P. Fourmanoir, 1955. — Poissons capturés par la mission de la « Calypso » en Mer Rouge. *Annls Inst. océanogr.*, **30** : 195-203, 2 figs.

Springer, Victor G., and John E. Randall, 1974. — Two new species of the labrid fish genus *Cirrhilabrus* from the Red Sea. *Israel Jour. Zool.*, **23** : 45-54, 6 figs.

Manuscrit déposé le 15 mars 1976.

Bull. Mus. natn. Hist. nat., Paris, 3e sér., no 436, janv.-févr. 1977, Zoologie 306 : 329-342.

Achevé d'imprimer le 30 avril 1977.

IMPRIMERIE NATIONALE

7 564 001 5

Recommandations aux auteurs

Les articles à publier doivent être adressés directement au Secrétariat du *Bulletin du Muséum national d'Histoire naturelle*, 57, rue Cuvier, 75005 Paris. Ils seront accompagnés d'un résumé en une ou plusieurs langues. L'adresse du Laboratoire dans lequel le travail a été effectué figurera sur la première page, en note infrapaginale.

Le *texte* doit être dactylographié à double interligne, avec une marge suffisante, recto seulement. Pas de mots en majuscules, pas de soulignages (à l'exception des noms de genres et d'espèces soulignés d'un trait).

Il convient de numéroter les *tableaux* et de leur donner un titre ; les tableaux compliqués devront être préparés de façon à pouvoir être clichés comme une figure.

Les *références bibliographiques* apparaîtront selon les modèles suivants :

Bauchot, M.-L., J. Daget, J.-C. Hureau et Th. Monod, 1970. — Le problème des « auteurs secondaires » en taxionomie. *Bull. Mus. Hist. nat., Paris*, 2e sér., 42 (2) : 301-304.

Tinbergen, N., 1952. — The study of instinct. Oxford, Clarendon Press, 228 p.

Les *dessins* et *cartes* doivent être faits sur bristol blanc ou calque, à l'encre de chine. Envoyer les originaux. Les *photographies* seront le plus nettes possible, sur papier brillant, et normalement contrastées. L'emplacement des figures sera indiqué dans la marge et les légendes seront regroupées à la fin du texte, sur un feuillet séparé.

Un auteur ne pourra publier plus de 100 pages imprimées par an dans le *Bulletin*, en une ou plusieurs fois.

Une seule épreuve sera envoyée à l'auteur qui devra la retourner dans les quatre jours au Secrétariat, avec son manuscrit. Les « corrections d'auteurs » (modifications ou additions de texte) trop nombreuses, et non justifiées par une information de dernière heure, pourront être facturées aux auteurs.

Ceux-ci recevront gratuitement 50 exemplaires imprimés de leur travail. Ils pourront obtenir à leur frais des fascicules supplémentaires en s'adressant à la Bibliothèque centrale du Muséum : 38, rue Geoffroy-Saint-Hilaire, 75005 Paris.


MUSEUM
NATIONAL
D'HIST. NAT.